Mirror Requirements for SAFIR

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Large-aperture lightweight low-cost cryogenic mirrors are an enabling technology for planned NASA far-infrared and sub-millimeter missions such as CMB-Pol, SAFIR and SPECS. This paper examines the mirror requirements necessary to design, build and characterize mirror segments for large space telescopes operating at temperatures of less than 10 K. Such mirrors should be diffraction limited in the far-IR with an areal density of less than 10 kg/m^2, aperture of 1 to 2 meters and cost of less than $500,000 per square meter.

From Spitzer to Herschel and Beyond Pasadena, California, June 2004 Conference Program and Abstracts